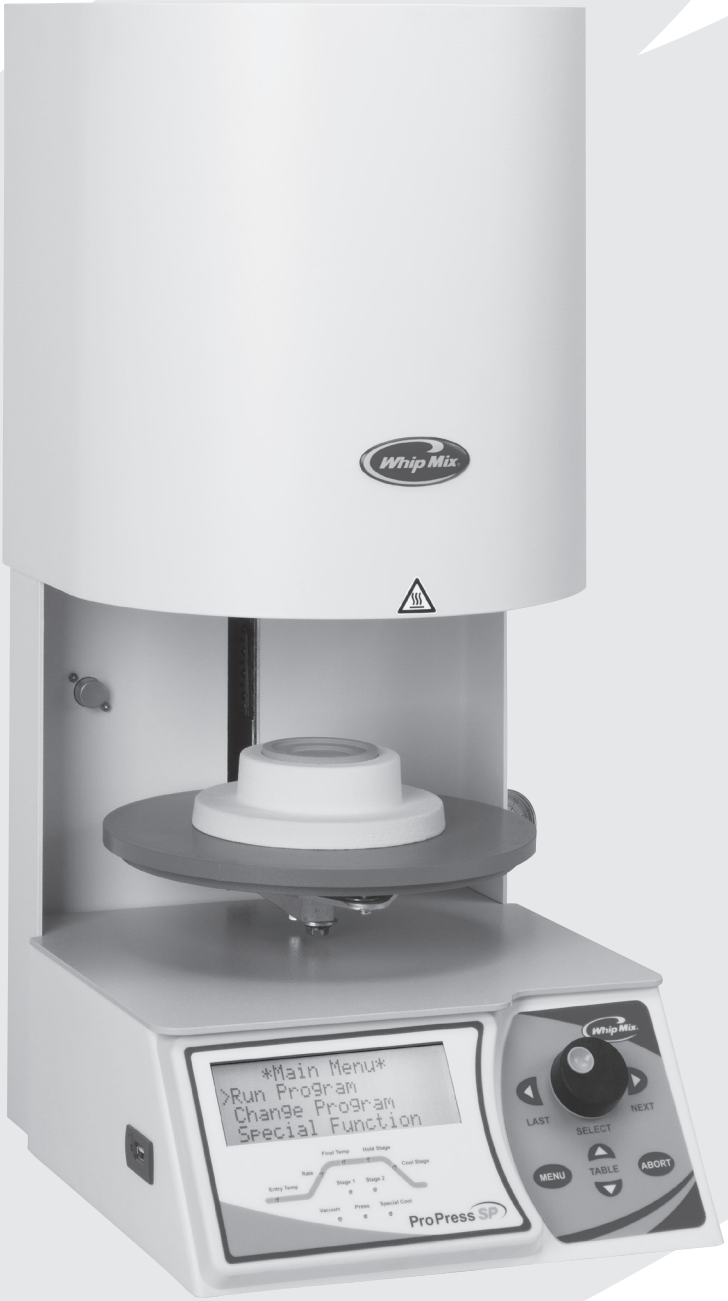
ProPress SP Furnace
Operator's Manual



Whip Mix Corporation • 361 Farmington Ave. • P.O. Box 17183 • Louisville, KY 40217-0183 USA
502-637-1451 • 800-626-5651 • Fax 502-634-4512 • www.whipmix.com

Warnings

DO NOT OPERATE THIS FURNACE WITH ANY OTHER POWER CORD.

DO NOT OPERATE WITH AN EXTENSION CORD.

OPERATING THIS FURNACE ON A CIRCUIT WITH OTHER FURNACES OR ELECTRICAL APPLIANCES THAT REQUIRE SIGNIFICANT POWER MAY CAUSE A CIRCUIT BREAKER TO TRIP.

CAUTION: METAL SURFACE IS HOT DURING OPERATION!

THE TRIANGULAR BLACK AND YELLOW STICKER ON THE FRONT CENTER OF THE MUFFLE HOOD IS A WARNING THAT THE METALLIC SURFACE CAN BECOME HOT TO THE TOUCH. NEVER PLACE YOUR HAND ON THIS SURFACE OR LEAN ON THE TOP OF THE HOOD WHEN THE UNIT IS IN OPERATION.

IMPORTANT: CONTACT YOUR DEALER OR THE FACTORY FOR COMPLETE INSTRUCTIONS ON CONVERTING THE FURNACE BETWEEN 115 VAC AND 220 VAC.

HAZARDOUS LIVE VOLTAGE PRESENT; DISCONNECT AC MAIN POWER CORD BEFORE REMOVING COVER.

Warranty

United States and Canada

Whip Mix Corporation warrants the ProPress SP to the original purchaser against defective workmanship and materials under normal procedures of installation, use and service within the dental profession, for a period of three years or 3750 muffle hours, whichever occurs first. During which time Whip Mix Corporation will replace, repair or deny warranty coverage at its discretion. Heat treating refractory materials, misuse, improper installation, improper maintenance, accident or abuse will void the warranty. Whip Mix coverage only applies to Whip Mix supplied parts, and repairs performed by Whip Mix certified repair technicians. Repairs performed during the warranty period do not extend the warranty period. Shipping damage is only covered from Whip Mix to the intended recipient.

International

Two years parts and labor from date of purchase from dealer.

Intended Use:

The ProPress SP furnace is only intended for the firing of dental porcelain materials or the pneumatic pressing of molten porcelain materials into lost wax investment molds. If this furnace is not used in a manner specified by the Whip Mix Corporation, the protection provided by the product might be impaired.

Recommendations

Note: During shipping the muffle might absorb moisture from the air. So, it is recommended you heat the muffle to dry the moisture before firing any porcelain. To dry the muffle, set the idle temperature to 400° C (752° F) for one hour and 600° C (1112° F) for one hour with the firing tray in place and the table left open.

Follow the numbered instructions on page 10 to set the idle temperature to the temperatures mentioned above. Whip Mix recommends leaving the furnace on at all times.

Turning the furnace off overnight may cause damage to the muffle, contamination and void the warranty.

Leaving your furnace on will also extend the life of your furnace. See Night Mode, page 10 for further information.

The ProPress SP Accessories Include:

CD: Master Suite Software, Operator's Manual, Furnace Tips
Flash Drive
Quick Start Guide
Cooling Tray
Firing Tray
Press Firing Tray
Ceramic Insert
Power Cord
Temperature Calibration Certificate
Program Magnet
Quick Cool Barb and Hose
Warranty Registration Card

Table of Contents

External Component Locator 4

Chapter One — Getting Started

Before Unpacking 5
Unpacking 5
Press Version 5
Installing the Vacuum Pump 5
Quick-Cool Jet Installation 6
Power 7
Front Panel Controls 7
Menu Selection Buttons 8
Information Display and Entry 9
Start Program 9
Abort Program 9
Using the Furnace 9

Chapter Two — Special Functions

Setting the Night Mode Temperature and Activation 10
Change Idle Temperature 10
Set Vacuum Level 11
Select Constant or Intermittent Vacuum 11
Set Displayed Temperature Units (Celsius or Fahrenheit) 11
Set Program Start Delay 12
Set Music Volume Level 12
Set to All Capital Text or Mixed Upper/Lower Case Text Display 12
Select Displayed Language 12
Saving Programs to a Flash Drive (Exporting) 13
Transferring User Firing Programs to Other Furnaces (Importing) 13
Low Fusing Adjust 14
High Fusing Adjustment 14
Press Fusing Adjust 15
Testing Your Furnace 16
Calibrate Oven 16

Chapter Three — Change Program Menu

Look at a Program 17
Add/Edit a Program 18
Introduction to Sense Pressing 20
Add/Edit a Sense Press Program 22
Conventional Press Firing Cycle Program 23
Copy/Change a Program 25
Move a Program 25
Erase a Program 25

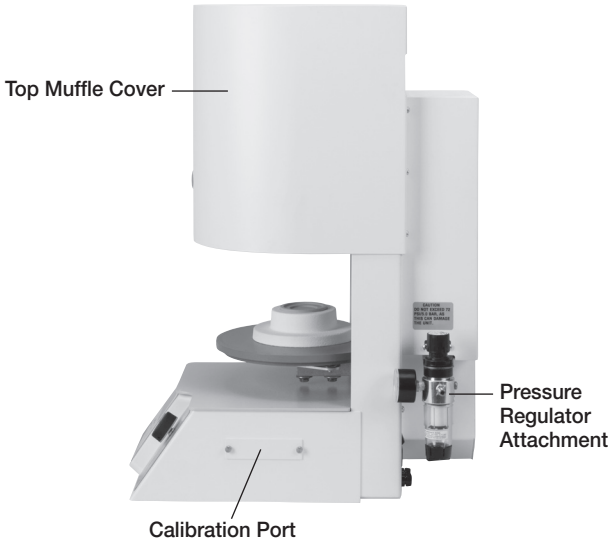
Chapter Four — Run Program Menu

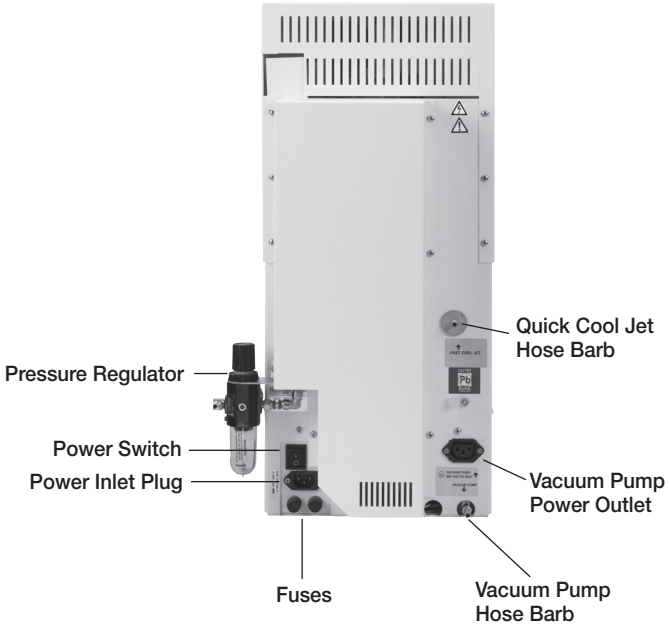
Running a Program – Repeat Programs 26
Loading Your Work Into the Furnace 26
Features and Displays Available While a Program is Running 26
The LED Graph 27
Running a Pressing Program 28
Split Mold Salvage Feature 28
Running a Re-Press Program 29

Chapter Five — Maintenance

Cleaning the Furnace 30
Purge/Decontamination 30
Trouble Shooting Guide 30
Vacuum Test 31
Fuses 31
If More Help is Needed 31
Replacement Parts 32
Technical Specifications 32
Pro Series Accessories 33
Fahrenheit to Centigrade 34
Centigrade to Fahrenheit 34

External Component Locator





Chapter One — Getting Started

You are undoubtedly eager to unpack, set up, and begin using your new furnace. Getting started will be much easier if you carefully review the information in this chapter and follow the steps as outlined.

Before Unpacking

- Save the carton and packing materials. These will be used again if there is ever a need to ship or return equipment.
- Read and save the printed shipping material packed with your furnace — it contains valuable information!
- **DO NOT turn on the power to your furnace until you are instructed to do so, or you will damage your furnace!**
- Sit the furnace on a non-flammable work surface.

Unpacking

- If the packaging materials and/or the furnace appear to be damaged, please call your dealer before continuing.
- Remove the furnace from the packing materials and place it on a flat surface in the upright position.
- Look up into the muffle area and locate the shipping hardware and remove it. Keep these parts in case there is a need to ship the furnace back.

Press Version

The ProPress SP requires compressed air to run a press cycle.

- Connect the compressed air supply to the regulator using a standard pneumatic fitting available at most hardware stores.
- Adjust the pressure regulator to the recommended minimum air pressure of 70 psi/4.8 BAR and a maximum of 72 psi/ 4.96 BAR. Check with the ceramic manufacturer.

INPUTTING MORE PRESSURE COULD CAUSE AN EXPLOSION!

If problems arise:

- Check the air supply for sufficient pressure.
- Check all connections. If problems persist, write down your serial number and call Technical Support.

Installing the Vacuum Pump

If you have a Whip Mix vacuum pump, plug it directly into the furnace where indicated on the back. If the pump is not a Whip Mix pump, you will need an adaptor.

- Attach a 1/4" inch vacuum rated hose from the vacuum pump to the brass fitting marked **VACUUM PUMP** at the rear of the furnace.

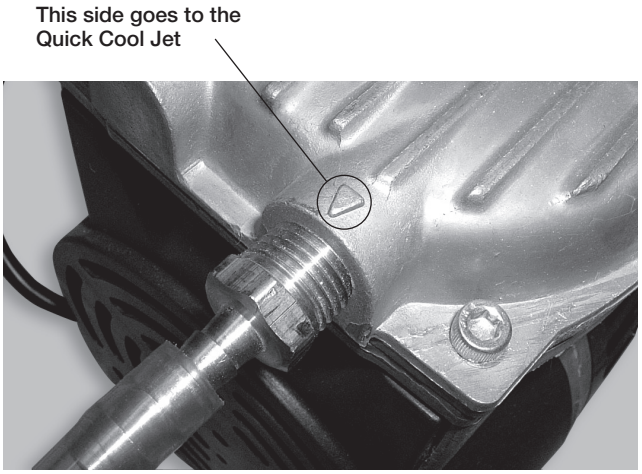
If problems arise:

- Check the air supply for sufficient pressure.
- Check all connections. If problems persist, write down your serial number and call Technical Support.

Quick-Cool Jet Installation

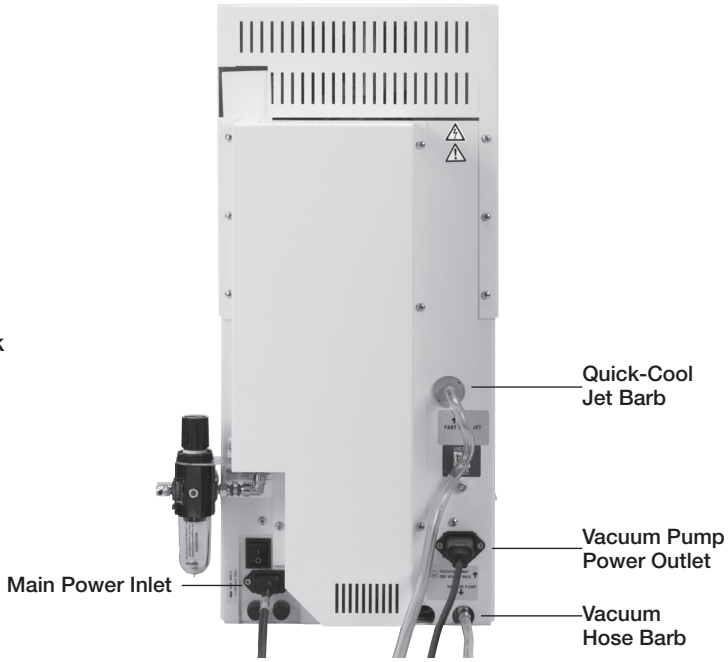
Preparation:

1. Remove the vacuum pump from its box.
2. Remove the brass hose barb from the Furnace accessory box.
3. Remove the muffler from the output end of the vacuum pump. (The input and output valves are identified by arrow indicators on the vacuum pump near inlet or outlet.)
4. Install the brass barb to output end of the vacuum pump. (Where the muffler used to be.)
5. There should be two hoses included. One in the accessory box, the other inside the vacuum pump box. Use the hose included in the accessory box for the Quick-Cool Air Jet.



Installation:

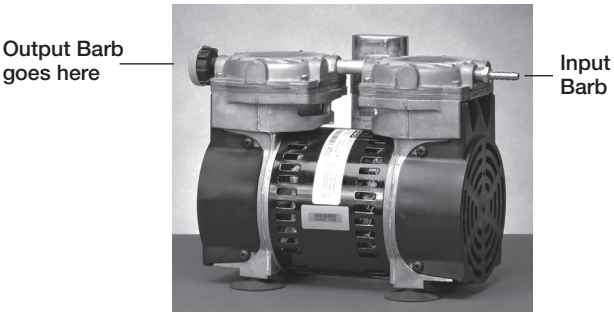
1. Push one end of the clear hose included in the accessory box over the output barb fitting at the output end of the vacuum pump.
2. Place the other end over the silver Quick-Cool Jet barb located on the upper right back of the furnace. (See below.)
3. Using the other pink hose, place one end over the input side barb of the vacuum pump.
4. Place the other end over the vacuum barb at the back of the furnace.
5. Plug the power cord into the power outlet at the back of the furnace next to the furnace power inlet.



Using the Quick-Cool Jet:

The Quick-Cool Jet will activate when a program has been started with a lower entry temperature than the furnace's current temperature.

1. To enable the Quick-Cool Jet, select and run a program with an entry temperature lower than the current temperature.
2. Once a program is complete, start the next program and the Quick-Cool Jet will engage.

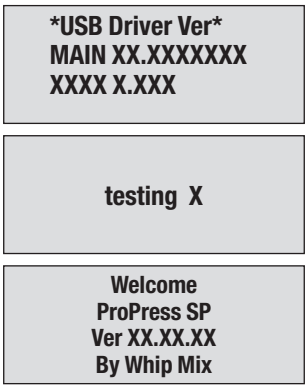


Power

- The furnace requires 115 Vac and 12 Amps of current in the United States and 220–240 Vac and 7.0 Amps of current in Europe and some parts of Asia.
  A special heavy-duty power cord has been supplied with your furnace.

DO NOT OPERATE WITH ANY OTHER POWER CORD. DO NOT OPERATE WITH AN EXTENSION CORD. OPERATING THIS FURNACE ON A CIRCUIT WITH OTHER FURNACES OR ELECTRICAL APPLIANCES THAT REQUIRE SIGNIFICANT POWER MAY CAUSE A CIRCUIT BREAKER TO TRIP OR OTHER FUNCTION PROBLEMS WITH THE FURNACE. INSTALL THE HEAVY-DUTY POWER CORD AND PLUG THE FURNACE INTO A GROUNDED OUTLET.

- Position the furnace so that the front is facing you. You should be able to reach the power switch on the right side of the furnace at the rear. Be sure to have at least 8 inches on all sides of the furnace to allow sufficient airflow to keep the electronics of the furnace cool. Do not place anything flammable near the furnace.
- Minimum ambient room temperature: 60° F (15.5° C).
  Maximum ambient room temperature: 80° F (26.6° C).
  Minimum relative humidity: 45%.
  Maximum relative humidity: 60%.
- Turn the furnace on using the power switch. The display should light up and the unit will perform an internal self test for about 30 seconds. The following screens will be displayed in this process.



NOTE: THE ACTUAL VERSION NUMBER OF YOUR FURNACE WILL REPLACE X.XX.XX IN THE ABOVE ILLUSTRATION.

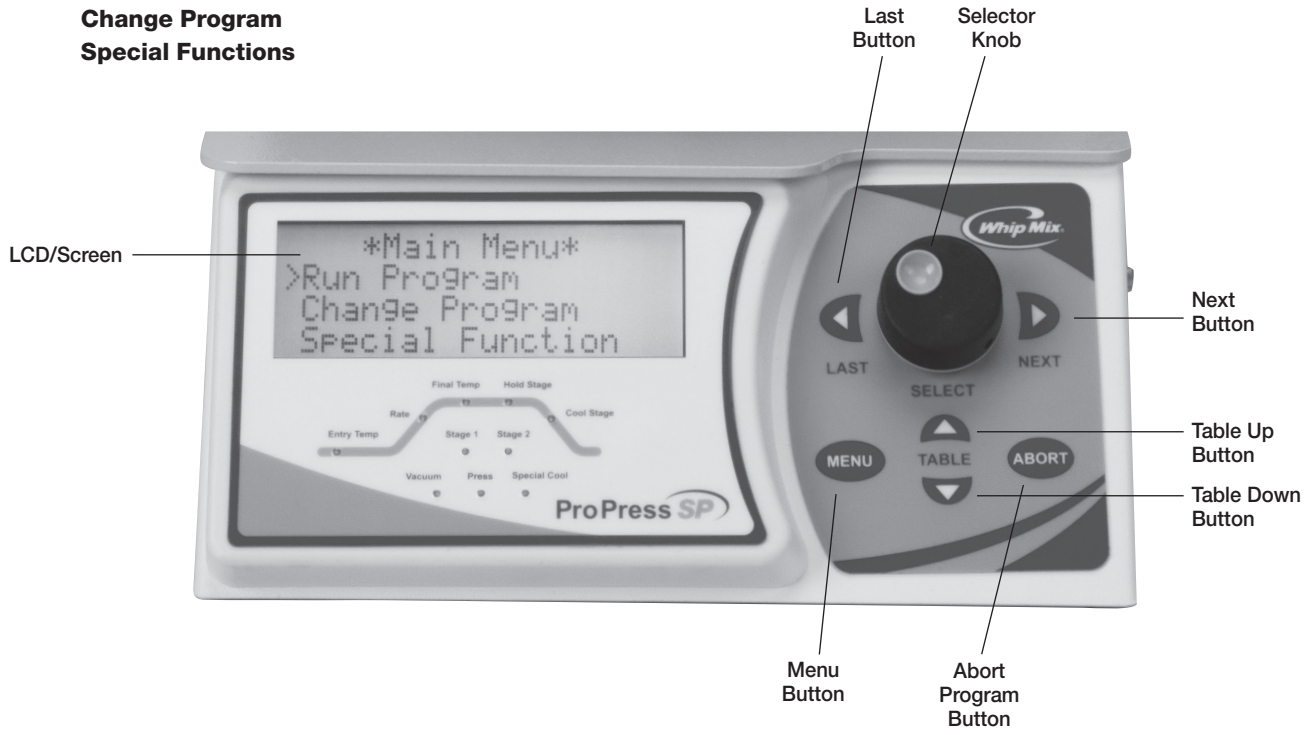
NOTE: THE QUICK START GUIDE PROVIDES AN EASY, STEP BY STEP, SEQUENCE FOR RAPID SETUP AND INITIAL CONFIGURATION AND RUNNING YOUR FIRST PROGRAM.

Front Panel Controls

The front panel controls and their basic functions are described in this section. **Please read this section carefully.**

The front panel controls are divided into four groups:

- Menu selection button calls up various function selections:
  Run Program
  Change Program
  Special Functions
- Information entry: **Selector Knob, Next** and **Last**
- Program **Abort** button
- Table control buttons: **Up/Down**



Menu Selection

The three menu selection items (Run Program, Change Program and Special Functions) will display different options. The menu options can be seen by turning the **Selector Knob**.

Run Program — Press the **Run Program** Selection to:

- Select a program to run.

Change Program — the following actions may be initiated by first pressing the **Change Program** item from the **Main Menu**, then turning the **Selector Knob** to display the following options:

- Look at a program
- **Add/Edit** a program
- **Copy/change** a program
- **Move** a program
- **Erase** a program

Special Functions — press the **Selector Knob** and turn the **Selector Knob** to one of the following actions:

- Start Night mode
- Change Idle temperatures
- Set vacuum level
- Select degree C (Centigrade, centimeters), or F (Fahrenheit, inches)
- Set program start delay
- Set Night mode temperature
- Select between constant vacuum pump or intermittent cycle vacuum pump
- Change volume level of sounds
- Select upper or lower case letters on the display
- Select Displayed Language (English, French, German, Italian, Spanish)
- Cal Low Fusing
- Cal High Fusing
- Cal Press Fusing
- Copy firing programs from Furnace to Memory Card (Export Programs)
- Copy firing programs from Memory Card to Furnace (Import Programs)
- Export Settings
- Import Settings
- Test Furnace
- Calibrate Oven

Information Display and Entry

DISPLAY — All information and user prompts will be shown on the display (four lines, twenty characters each).

SELECTOR KNOB — Turn the **Selector Knob** left or right to select menu options or to adjust parameters.

NEXT — Press the **Next** button to proceed to the next step within a function or program. (OR just push the **Selector Knob** inward to proceed).

LAST — Press this button to return to the preceding step within a function or program. If a program is not displayed then the furnace will beep to indicate an error.

TABLE UP — Press the ⬆ **up** arrow button to manually raise the table. Press the ⬆ **up** arrow button a second time and the table will stop.

TABLE DOWN — Press the ⬇ **down** arrow button to manually lower the table. Press the ⬇ **down** arrow button a second time and the table will stop.

The table control button will not operate while a program is running.

Start Program

- Immediately After Power-On Self-Test Completes — Rotate the **Selector Knob** to select a Program, then press the **Selector Knob** to initiate the Program.
- Immediately After a Previous Program Completes — Pressing the **Selector Knob** after a program has just finished will restart the same program. Or rotate the **Selector Knob** to a new Program selection and press the **Selector Knob** to initiate the Program.

Abort Program

- Press the **Abort** key on the Keypad, select Yes, and press the **Next** button. The temperature will begin dropping to Idle temp and the Table will automatically lower.

Using the Furnace

After the furnace has completed the self-test at power up, the Firmware Version appears on the screen, then the **Main Menu** is displayed. Select the **Special Functions** menu item and proceed with the initial setup of essential default values for functions like:

- Idle Temperature
- Vacuum Threshold Level for Intermittent Vacuum mode
- Temperature Display Units (C or F)
- Program Start Delay Time (Default is none)
- Night Mode Temperature
- Constant Vacuum Pump (Default is “NO” for Intermittent Vacuum)
- Sound Volume Adjust
- Capital Letter Display (Default is mixed upper and lower case display)
- Displayed Language

NOTE: IT IS VERY IMPORTANT TO SET UP THE OPERATING FEATURES OF THE FURNACE BEFORE YOU ATTEMPT TO PROGRAM THE FURNACE OR RUN PROGRAMS. FOR BEST RESULTS IN LEARNING TO USE YOUR NEW FURNACE, USE THE FOLLOWING STEPS, IN THIS ORDER:

1. Set up the operating features of the furnace by reading and following the instructions in **Chapter 2 — Special Functions**. This is **VERY IMPORTANT** because these operating features will affect how you enter and run programs.
2. Learn to program the furnace by reading **Chapter 3 — Change Program.** Enter a few of your own programs.
3. Read **Chapter 4 — Run Program** to understand how to run programs and what features are available while running a program.

Chapter Two — Special Functions

To look at or change a function, press the **Special Functions** item from the **Main Menu**. Turn the **Selector Knob** clockwise or counterclockwise until the desired function is displayed. Press the **Selector Knob** OR the **Next** button to look at or change this function. Each function will be described in this chapter.

Most Special Functions can be performed while a program is running, however this is not recommended because changing the operating features could affect how the current program runs.

Setting the Night Mode Temperature and Activation

The furnace has a **Night Mode** feature that will reduce the temperature in the muffle and raise the lift to prevent moisture build up.

The **Night Mode** can be started from **idle mode** or while a program is running.

The furnace will automatically enter **Night Mode** if no buttons have been pressed for 2 hours, or 45 minutes have passed since the last run program and no buttons have been pressed.

The furnace comes from the factory with the **Night Mode** temperature set at 150° C (302° F). This temperature may be adjusted from 0 to 400° C (752° F).

If **Night Mode** is activated while a program is running, the furnace will go to the **Night Mode** temperature after the completion of the program and will maintain the **Night Mode** temperature until any button is pressed or the power is turned off.

To adjust the **Night Mode** temperature:

1. From the **Main Menu**, press the **Special Functions** item.
2. Turn the **Selector Knob** until the display reads **NIGHT MODE TEMP.**
3. Press the **Next** button to look at or change the night mode temperature.
4. Turn the **Selector Knob** to change the temperature as desired.
5. Press the **Next** button to enter the temperature. You will be returned to the **Main Menu** automatically.

After the **Night Mode** Temperature has been set, follow these steps to activate **Night Mode** from **idle mode** or during a program.

1. From the Main Menu, select the **Special Function** item. Turn the **Selector Knob** to the displayed item **Night Mode.**

2a. Push the **Selector Knob** OR press the **Next** button to activate **Night Mode.**

2b. To start **Night Mode** at the end of the program while a program is running.

Turn the **Selector Knob** to **NEXT** = **NIGHT MODE** and press the **Selector Knob** or **Next** button.

```
* Special Functions
> Night Mode
  Change Idle Temp
  Set Vacuum Level
```

Change Idle Temperature

The idle temperature is the temperature the furnace will maintain between programs. The furnace comes from the factory with the idle temperatures set at 0° C, so you must enter a temperature for this feature to suit your needs.

1. Press the **Menu** button.
2. Select **Special Functions**, push **Selector Knob** OR press **Next** button
3. Turn the **Selector Knob** to display **CHANGE IDLE TEMP.**
4. Push **Selector Knob** OR press the **Next** button to look at or change the idle temperature.
5. The current setting will be displayed. Turn the **Selector Knob** to change to the desired temperature.
6. Push the **Selector Knob** OR press the **Next** button to enter the temperature. You will be returned to the Main Menu automatically.

NOTE: DURING SHIPPING THE MUFFLE MIGHT ABSORB MOISTURE FROM THE AIR. SO, IT IS RECOMMENDED YOU HEAT THE MUFFLE TO DRY THE MOISTURE BEFORE FIRING ANY PORCELAIN. TO DRY THE MUFFLE, SET THE IDLE TEMPERATURE TO 400° C (752° F) FOR ONE HOUR AND THEN 600° C (1112° F) FOR ONE HOUR. IT IS ALSO RECOMMENDED YOU KEEP THE FURNACE ON WITH SUFFICIENT NIGHT MODE TEMPERATURE TO PREVENT MOISTURE FROM ACCUMULATING INSIDE THE MUFFLE. THE RECOMMENDED TEMPERATURE IS A MINIMUM OF 150° C (302° F). IF LEAVING THE LAB FOR AN EXTENDED PERIOD OF TIME, YOU MAY TURN THE FURNACE OFF WITH THE TABLE IN THE CLOSED POSITION. BEFORE FIRING PORCELAIN AGAIN, GO THROUGH THIS DRY OUT PROCEDURE.

Set Vacuum Level

The factory setting for vacuum is 71 cm of mercury. The acceptable range is from 28 cm to 74–75 **cm of mercury** or 11.0 inches to 30.0 **inches of mercury.**

If the furnace does not pull a minimum vacuum of 25 cm within 20 seconds of calling for it, the program will be aborted and the furnace will display "Vacuum Error."

Additionally, if the target vacuum level has not been reached within 3 cm of the vacuum setting by 100 seconds, the program will be aborted and a warning screen will be displayed, indicating a vacuum error. (see page 29 for error codes)

If **Continuous VAC Pump** has been selected by using the Special Functions menu, the vacuum pump will run throughout the vacuum cycle at full vacuum. If **Continuous VAC Pump** has not been selected, the vacuum pump will shut off after the target level has been reached and at least 5 seconds have elapsed. The vacuum pump will be restarted when the vacuum level has dropped to 2 cm below the Vacuum setting value.

The furnace uses an **absolute vacuum sensor**. With an absolute sensor, vacuum adjustments are not necessary at high altitudes.

To set the vacuum level for all programs do the following:

1. Press the **Menu** button.
2. Select **Special Functions**, push **Selector Knob** OR press **Next** button.
3. Turn the **Selector Knob** until **SET VACUUM LEVEL** is displayed.
4. Push **Selector Knob** OR press the **Next** button to look at or change the vacuum level.
5. The current setting will be displayed. Turn the **Selector Knob** to change this value.
6. Push **Selector Knob** OR press the **Next** button to accept the new value. You will be returned to the Main Menu automatically when the **Selector Knob** or **Next** button is pushed. The furnace may be set to display all values using the metric system with degrees in Centigrade and vacuum in centimeters of mercury OR to display all values using the American/English (standard) system of degrees. Fahrenheit and vacuum in inches of mercury.

Select Constant or Intermittent Vacuum

Selecting constant vacuum will cause the vacuum pump to run continuously during the vacuum cycle of a program.

1. Press the Main **Menu** button.
2. Select Special Functions, push the **Selector Knob** OR press the **Next** button.
3. Turn the **Selector Knob** until the display reads **CONSTANT VAC PUMP.**
4. Push the **Selector Knob** OR press the **Next** button.
5. Turn the **Selector Knob** to display **YES** or **NO.** A selection of yes will cause the vacuum pump to run continuously during the vacuum cycle of a program.

A selection of no will allow the vacuum pump to turn off and on to maintain the set vacuum level. (Intermittent Vacuum replenishment)

NOTE: IF INTERMITTENT VACUUM IS SELECTED, BUT THE VACUUM PUMP RUNS CONTINUOUSLY DURING THE PROGRAM CYCLE, THE VACUUM LEVEL IS SET TOO HIGH. THE ACTUAL LEVEL IS WITHIN 3% OF THE SELECTED LEVEL, BUT THE PUMP CANNOT REACH THE FULL SELECTED LEVEL. THIS CAN BE CORRECTED BY REDUCING THE VACUUM LEVEL.

Set Displayed Temperature Units (Celsius or Fahrenheit)

1. Press the **Menu** button.
2. Select **Special Functions**, push the **Selector Knob** OR press the **Next** button.
3. Turn the **Selector Knob** until **TEMP IN C OR F?** is displayed.
4. Push the **Selector Knob** OR press the **Next** button to look at or change the measurement system in use.
5. **TEMP CENTIGRADE?** Will be displayed. Turn the **Selector Knob** to select **YES** for metric Centigrade units, or if you select **NO** the furnace will automatically set to Fahrenheit units (American/English) (standard) units.
6. Push the **Selector Knob** OR press the **Next** button to save the selection. You will be returned to the **Main Menu** automatically.

Set Program Start Delay

The furnace has a unique feature that allows the operator to program a delay to occur before the start of all programs. This delay occurs before the entry time set into each program begins. This feature may be changed without affecting the programs or calibrations stored in the furnace.

1. Press the **Main Menu** button.
2. Select **Special Functions**, push the **Selector Knob** OR press the **Next** button.
3. Turn the **Selector Knob** until the second line on the display reads **PROG START DELAY.**
4. Press the **Next** button to look at or change the start delay time.
5. The display will read **TIME = 0.00** or any time delay previously entered. Turn the **Selector Knob** to change the time as desired.
6. Push the **Selector Knob** OR press the **Next** button to save your selection. You will be returned to the Main Menu automatically.

NOTE: THE DELAY FEATURE SUBTRACTS FROM THE TIME IT TAKES TO HEAT THE MUFFLE TO THE ENTRY TEMPERATURE SO THE DELAY TIME MAY APPEAR SHORTER THAN ORIGINALLY PROGRAMMED. AS AN EXAMPLE; LET'S ASSUME THE DELAY IS SET FOR 30 MINUTES, THE ENTRY TEMPERATURE IS 500° C, AND THE TIME IT TAKES THE FURNACE TO REACH 500° C FROM THE POINT WHICH YOU ENTERED THE DELAY IS 15 MINUTES. THE FURNACE WOULD COUNT DOWN 15 MINUTES TO THE BEGINNING OF THE PROGRAM AND THEN WOULD BEGIN HEATING TO THE ENTRY TEMPERATURE. THIS GIVES US A TOTAL OF 30 MINUTES BEFORE THE TABLE RISES TO THE MUFFLE.

Set Music Volume Level

1. Press the **Main Menu** button.
2. Select **Special Functions**, push the **Selector Knob** OR press the **Next** button.
3. Turn the Selector Knob until display reads **CHANGE MUSIC VOLUME.**
4. Push the **Selector Knob** OR press the **Next** button. Continue to turn the **Selector Knob** to the desired volume. The cursor will appear to the left of the volume selected.
5. Rotate the **Selector Knob** and a sequence of tones will begin playing to give you an audible reference for the corresponding sound level. When the volume level is set to your liking, push the **Selector Knob** OR press the **Next** button to save your selection. You will be returned to the Main Menu automatically.

Set to All Capital Text or Mixed Upper/Lower Case Text Display

1. Press the **Main Menu** button.
2. Select **Special Functions**, push the **Selector Knob** OR press the **Next** button.
3. Turn the **Selector Knob** until display reads **CAPITAL LETTER?**
4. Push the **Selector Knob** OR press the **Next** button.
5. If you want all Capital Letters displayed, rotate the **Selector Knob** to **Yes** and push the **Selector Knob** OR press the **Next** button. If you do not want all Capital letters, rotate to **No** for mixed upper/lower case letters and press the **Selector Knob** OR press the **Next** button.

Select Displayed Language

1. Press the **Main Menu** button.
2. Select **Special Functions**, push the **Selector Knob** OR press the **Next** button.
3. Turn the **Selector Knob** until the display reads **SELECT LANGUAGE.**
4. Push the **Selector Knob** OR press the **Next** button.
5. Choose from the following list of languages:
   > English
   Francais
   Deutch
   Italiano
   Espanol
6. Rotate the **Selector Knob** until the cursor points to the desired language and push the **Selector Knob** OR press the **Next** button to save your selection. You will be returned to the **Main Menu** automatically.

Saving Programs to a Flash Drive (Exporting)

1. Place the Flash Drive in the USB slot on the left side of the furnace.
2. Select the **Special Functions** item from the Main Menu.
3. Turn the **Selector Knob** until the display reads **EXPORT PROGRAM**, then press the Next button.
4. The display will show **Check USB Driver**, then **Exporting >>>>>>>**
5. The furnace will signal the end of the transfer with an audible tone.

Transferring User Firing Programs to Other Furnaces (Importing)

Once you have exported programs to the Flash Drive, either via the furnace **EXPORT PROGRAM** function OR via the **PC Software**, you can load these programs on a different furnace or return them to the same furnace.

1. Place the Flash Drive in the USB slot on the left side of the furnace.
2. Select the **Special Functions** item from the **Main Menu**.
3. Turn the **Selector Knob** until the display reads **IMPORT PROGRAM**, then press the **Next** button.
4. The display will show **Check USB Driver**, then **Importing >>>>>>>**
5. The furnace will signal the end of the transfer with an audible tone.

Low Fusing Adjust

Calibration (800° C/1470° F or below)

1. Select the **Special Functions** item from the **Main Menu**.
2. Turn the **Selector Knob** until display reads **CAL LOW FUSING.**

```
* Special Functions
  Select Language
> Cal Low Fusing
  Cal High Fusing
```

3. Press the **Next** button.

The display will show the current Low Fusing porcelain calibration offset. For new furnaces this should be "0". If the Selector Knob is rotated clockwise note that the "0" value changes to a positive value, and if rotated counter-clockwise it changes to a negative value. If you need to raise ALL your Low Fusing program firing temperatures by the same amount you can dial in a positive value then press the **Next** button to accept the offset value. Conversely, if you want to lower ALL your Low Fusing program firing temperatures by the same amount, dial in a negative value and press the **Next** button to accept the offset value.

Example: If your porcelain appears to be overfired by 25°, you would enter a negative (-25) twenty-five degree value to lower the effective firing temperature of ALL the Low Fusing program.

4. Turn the **Selector Knob** to enter the number of degrees you would like to adjust the temperature.

```
Low Temp Adj
0C
(-50C - +50C)
```

5. Press the Next button. The adjustment will be stored and you will be returned to the main menu.

Example:

If porcelain looks under-fired, increase temperature.

If porcelain looks over-fired, decrease temperature

High Fusing Adjustment

Calibration (801° C/1471° F or above)

1. Select the **Special Functions** item from the Main Menu.
2. Turn **Selector Knob** until display reads **CAL HIGH FUSING.**

```
* Special Functions
  Select Language
> Cal Low Fusing
  Cal High Fusing
```

3. Press the **Next** button.

The display will show the current High Fusing porcelain calibration offset. For new furnaces this should be "0". If the Selector Knob is rotated clockwise note that the "0" value changes to a positive value, and if rotated counter-clockwise it changes to a negative value. If you need to raise ALL of your High Fusing program firing temperatures by the same amount you can dial in a positive value then press the **Next** button to accept the offset value. Conversely, if you want to lower ALL of your High Fusing program firing temperatures by the same amount, dial in a negative value and press the **Next** button to accept the offset value.

Example: If your porcelain appears to be overfired by 25°, you would enter a negative (-25) twenty-five degree value to lower the effective firing temperature of ALL the High Fusing programs.

4. Turn the **Selector Knob** to enter the number of degrees you would like to adjust the temperature.

```
High Temp Adj
0C
(-50C - +50C)
```

5. Press the **Next** button. The adjustment will be stored and you will be returned to the main menu.

Example:

If porcelain looks under-fired, increase temperature.

If porcelain looks over-fired, decrease temperature

Press Fusing Adjust

Conventional and SP Pressing Programs

1. Select the **Special Functions** item from the Main Menu.
2. Turn the **Selector Knob** until display reads **CAL LOW FUSING.**

```
* Special Functions
> Cal Press Fusing
  Export Program
  Import Program
```

The display will show the current Press Fusing porcelain calibration offset. For new furnaces this should be “0”. If the Selector Knob is rotated clockwise note that the “0” value changes to a positive value, and if rotated counter-clockwise it changes to a negative value. If you need to raise ALL of your Press Fusing program firing temperatures by the same amount you can dial in a positive value then press the **Next** button to accept the offset value. Conversely, if you want to lower ALL of your Press Fusing program firing temperatures by the same amount, dial in a negative value and press the **Next** button to accept the offset value.

3. Press the **Next** button.
4. Turn the **Selector Knob** to enter the number of degrees you would like to adjust the temperature.

```
Press Temp Adjust
0C
(-50C - +50C)
```

5. Press the Next button. The adjustment will be stored and you will be returned to the main menu.

Example:

If porcelain looks under-fired, increase temperature.

If porcelain looks over-fired, decrease temperature

Testing Your Furnace

The Pro Series Furnaces are capable of performing several tests to aid in diagnosing the furnace should a problem occur. A TOPS technician or Technical Support technician may ask you to run one or more of these tests to aid in diagnosing the problem. The tests include:

- Vacuum test
- Muffle test
- Motor Up test
- Motor down test
- Muffle hour reading. (The muffle hour reading is incremented by 1 for each hour the muffle temperature is above 605° C.)
- Press test

To Begin Test:

1. Select the **Special Functions** item from the **Main Menu**.
2. Turn the **Selector Knob** until the display reads **TEST FURNACE.**
3. Push the **Selector Knob** OR press the **Next** button.
4. Turn the **Selector Knob** until the test you require is displayed.
5. Push the **Selector Knob**. (The individual test, which was selected, will now begin.)
6. Pressing the **Next** button will pause the test. Pressing the **Next** button again will restart.
7. Pressing the **Menu** button will end the test and return you to the Main Menu.

Calibrate Oven

CAUTION: THIS ITEM OF THE SPECIAL FUNCTIONS MENU IS TYPICALLY RESERVED FOR WHIP MIX CERTIFIED TECHNICIANS. ENTERING NUMBERS OTHER THAN THE ONES DESCRIBED BELOW COULD RESULT IN PROGRAM AND CALIBRATION LOSS.

With this screen it is possible to activate the following features:

- **Fast Cool With Vacuum On (for cooling muffle to entry temp between programs)** Lowers the lift and runs the vacuum pump until the furnace reaches the entry temperature for a program. To activate this function, start a program with an entry temperature lower than the current temperature.
- **Enable Program Password Protection** (Call Whip Mix TOPS Technicians.)
- **On ProPress SP;** use Timed Press; Yes/No Changes preference between Re-Press and Timed Press, press programs are factory set and include vacuum.

To access one of the four functions, do the following:

1. Select the **Special Functions** item from the Main Menu.
2. Turn the **Selector Knob** to **CALIBRATE OVEN.**
3. Push the **Selector Knob** OR press the **Next** button.
4. Turn the **Selector Knob** to select the numerical password needed.

Password Function	Numbers
1. Fast Cool with Vacuum On	Password 315
2. Enable Program Password Protection Protects all programs from alteration	(Call Whip Mix TOPS Technician)
3. Select Timed Press or Re-press Time If Yes is selected, then you will be prompted to enter the Repress Time. In this program 4 minutes will automatically be added to the time you enter. The default program is timed press which does not add and additional 4 minutes. **NOTE: PASSWORD 315 ONLY AFFECTS CONVENTIONAL PRESSING PROGRAM MODE. IT WILL HAVE NO EFFECT ON SENSE PRESS (SP) PROGRAMS.**	Password 315

Push the **Selector Knob** OR press the **Next** button. Enter the password and access the selected function.

Chapter Three — Change Program Menu

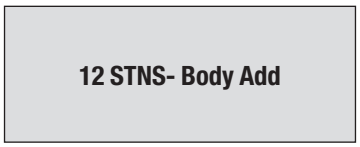
The Master Suite DVD provided with the furnace is an alternate means of adding or editing programs using a PC application. A memory stick is then used to transfer the programs from the PC to the furnace. Refer to the separate instructions provided in pdf format on the DVD.

The **Change Program** menu item allows you to add, change, move, copy, print, or erase programmed firing cycles. This mode is reached by selecting the **Change Program Item** from the **Main Menu**.

All of the features described here may be performed while a program is running. The Pro Series furnaces use a unique method of numbering and naming programs to help the operator select the correct program to run.

The Program Number is shown first (0-199), followed by the Program Name.

The following is an example of a program descriptor. The Program Number is displayed first, then a "-" character. The next fourteen characters contain the name entered to describe this program.



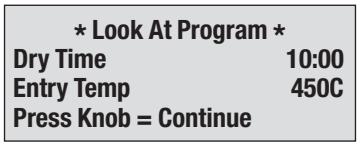
In the example, the user has entered **BODY ADD** to indicate that this is a body add-on program. The following examples show how a user could make program identification easy:

12 SYNS- BODY ADD	[Synspar porcelain body add program]
13 SYNS- GLAZE	[Synspar porcelain glaze program]
20 DE GAS	[Alloy de-gas program]

Look at a Program

The Look at a Program feature allows the operator to view a program without changing any values:

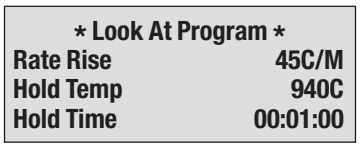
1. Select the **Change Program** from the **Main Menu**.
2. Turn the **Selector Knob** until **LOOK AT PROGRAM** is displayed.
3. Push the **Selector Knob** OR press the **Next** button to select this feature.
4. Turn the **Selector Knob** to find the program you wish to view.
5. Push the **Selector Knob** OR press the **Next** button to continue viewing each step through the program.



The first line displays a parameter in the firing cycle program and its value.

This firing parameter cannot be changed while looking at a program.

Pushing the **Selector Knob** OR pressing the **Next** button will let you look at the next parameter in a program. Pressing the **Last** button will let you look at the preceding item in a program.



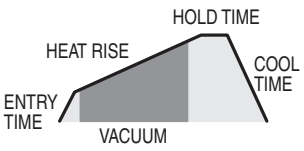
When the last item in a program has been viewed the display will return to the **Main Menu**.

Porcelain Firing

(See page 22 for adding a Sense Press Program)

Add/Edit a Program

Add/Edit a Program is used to enter a new program or Edit a pre-existing program. This selection will describe how to enter either a 1-Stage or a 2-Stage program.



The following procedure describes how to enter a normal porcelain program.

1. Press the Main **Menu** button.
2. Select the **CHANGE PROGRAM** item and push the **Selector Knob** OR press the **Next** button.
3. Turn the **Selector Knob** until **ADD/EDIT PROGRAM** is displayed.
4. Push the **Selector Knob** OR press the **Next** button. A cursor pointing to the current program number will be displayed. If there is a name displayed after the program number this is a pre-existing program which you may edit by selecting it.
5. To Add a program, rotate the **Selector Knob** to find the program number to which you want to add your new program. If you select a program number that already has a program entered, you will overwrite the existing program with the new one by entering new values.

```
Select Program
> 001–

Press Knob = Continue
```

6. Push the **Selector Knob** OR press the **Next** button to select a program for **Addition** or **Editing**. The display will present the “stage” type selection as below:

```
Select Type
> 1–stage
  2–stage
  Press
```

   If the program you wish to Add requires only a single Rate Rise and Hold Temperature, select 1-Stage. If the program requires an initial Rate Rise and Hold Temperature, followed by a secondary Rate Rise and Hold Temperature, select 2-Stage.

   Push the **Selector Knob** OR press the **Next** button to select the program type.

7. The display will change as shown below:

```
      * Add/Edit Program *
Enter Program Name
 001 –
```

   The ^ symbol under the line identifies the current character position being entered. Rotate the **Selector Knob** to bring up the desired character, then push the **Selector Knob** OR press the **Next** button to advance to the next character in the Program Name. You may enter up to 14 characters. If you do not require all 14 characters then simply hold down the **Next** button to space through the unneeded characters or press the **Selector Knob** and jump to the first Parameter entry screen.

8. Dry Time Entry

   Dry Time is the time it takes the table to go from the full down/open position to the table up/closed position. This will occur with several pauses in up motion during the travel to allow the work piece to dry gradually.

   The range of values is 00 hours, 00 minutes, 00 seconds, to a maximum of 1 hour, 39 minutes, and 00 seconds.

   Rotate the **Selector Knob** to select the time value, then push the **Selector Knob** OR press the **Next** button to store the parameter.

```
      * Add/Edit Program *
Dry Time              00:03:00

     (00:00:00–01:39:00)
```

9. Entry Temperature

   Entry Temperature is the temperature at which the table is closed completely and the temperature rise begins.

   The range of values is 25° C (77° F) to a maximum of 980° C (1796° F).

   Rotate the **Selector Knob** to select the temperature value, then push the **Selector Knob** OR press the **Next** button to store the parameter.

```
      * Add/Edit Program *
Entry Temp            400C

      (25C – 980C)
```

10. Rate Rise

    Rate Rise or ramp up, is the number of degrees per minute the temperature will rise after the table has closed.

    The range of values is 0° C/Minute (0° F) to a maximum of 100° C/Minute (180° F).

    Rotate the **Selector Knob** to select the heat rate value, then push the **Selector Knob** OR press the **Next** button to store the parameter.

```
      * Add/Edit Program *
Rate Rise             40C/M

     (00C/M – 100C/M)
```

11. Hold Temperature

    Hold Temperature or the top temperature is the final, highest temperature in a 1-Stage Program, and an intermediate stopover temperature in a 2-Stage Program.

    The range of values is 400° C (752° F) to a maximum of 1200° C (2192° F).

    Rotate the **Selector Knob** to select the temperature value, then push the **Selector Knob** OR press the **Next** button to store the parameter.

```
* Add/Edit Program *
Hold Temp              920C
      (400C – 1200C)
```

12. Hold Time

    Hold Time is the length of time the furnace stays at the top Hold Temperature. If the Program is a 2-Stage Program, there will be separate Hold Times for both Hold Temperature 1 and Hold Temperature 2.

    The range of values is 00 hours, 00 minutes, 00 seconds, to a maximum of 18 hours, 10 minutes, and 00 seconds.

    Rotate the **Selector Knob** to select the time value, then push the **Selector Knob** OR press the **Next** button to store the parameter.

```
* Add/Edit Program *
Hold Time              00:00:30
    (00:00:00–18:10:00)
```

NOTE: IF YOU ARE ADDING A 2-STAGE PROGRAM, THE RATE RISE 2, FOLLOWED BY THE HOLD TEMPERATURE 2, AND THE HOLD TIME 2 PARAMETERS WILL APPEAR HERE. IF NOT, THE TABLE DOWN TEMPERATURE WILL APPEAR NEXT.

13. Program Fusing Adjustment Parameter

```
Add/Edit Program
Fuse Adjust
>No
```

The display will show the current offset. For new furnaces this should be “0”. If the Selector Knob is rotated clockwise note that the “0” value changes to a positive value, and if rotated counter-clockwise it changes to a negative value. If you need to raise your program firing temperature, you can dial in a positive value then press the Next key to accept the offset value. Conversely, if you want to lower your program firing temperature, dial in a negative value and press the Next key to accept the offset value.

Why do you need program fusing adjustments?

The Program level **Fusing Adjust** is useful for making minor adjustments to a single, specific Program without altering the original Program design.

All furnaces have individual firing characteristics, even with identical settings. The Special Functions High/Low Fusing Adjustment features are useful for matching the firing characteristics of two furnaces so that they fire identically.

At the initial Program Addition, you will want to use the original suggested Program parameters, until your experience suggests a Program specific adjustment is indicated.

14. Table Down Temperature

    The **Table Down Temperature** is the temperature at which the table will open after the **Hold Time** expires.

    The range of values is 25° C (77° F) to a maximum of the final temperature.

    Rotate the **Selector Knob** to select the temperature value, then push the **Selector Knob** OR press the **Next** button to store the parameter.

```
* Add/Edit Program *
Table Down             920C
      (25C – 920C)
```

15. Cool Time

    The **Cool Time** parameter specifies the length of time the table takes to go from the full up position to the full down position, with several intermediate pauses along the way.

    The range of values is 00 hours, 00 minutes, 00 seconds, to a maximum of 1 hour, 39 minutes, and 00 seconds.

    Rotate the **Selector Knob** to select the time value, then push the **Selector Knob** OR press the **Next** button to store the parameter.

```
* Add/Edit Program *
Cool Time              00:00:00
    (00:00:00–1:39:00)
```

16. Use Vacuum

    The default value for Use Vacuum is **YES**.

    First, enter the **Level of Vacuum** desired. This is the value at which the pump will cut off if you are using Intermittent Vacuum (See **Special Functions** selections for choosing Intermittent or Constant Vacuum) If the value drops more than 2 cm of mercury lower than the value specified here during Intermittent Vacuum use, the vacuum pump will automatically start and run until the programmed Level is once again reached, then automatically cut off. This will occur as many times as required.

    The range of Vacuum Level settings is 28 cm of mercury to a maximum of 75 cm of mercury, although pumps weaken over time and usage. 71 cm of mercury is the default Level.

    Rotate the **Selector Knob** to select the vacuum value, then push the **Selector Knob** OR press the **Next** button to store the parameter.

17. Start Vacuum

Add/Edit Program
Use Vacuum
>Yes

This parameter controls when the vacuum pump comes on. The selections are made by rotating the **Selector Knob** as in the example below. The range will be different depending on the values already put into the program.

	Correct Ranges
• Rate Rise (1)	400° C to 1200° C
• Hold Time (1)	00:00:00 to 18:10:00
• Rate Rise 2 (2-Stage Program)	400° C to 1200° C
• Hold Time 2 (2-Stage Program)	00:00:00 to 18:10:00

Rotate the **Selector Knob** to select the setting, then push the **Selector Knob** OR press the **Next** button to store the parameter.

18. Release Vacuum

This parameter controls when the vacuum is released, and either air is allowed to enter the muffle. The selections are made by rotating the **Selector Knob** as in the example below. The range will be different depending on the values already put into the program.

	Correct Ranges
• Rate Rise (1)	400° C to 1200° C
• Hold Time (1)	00:00:00 to 18:10:00
• Rate Rise 2 (2-Stage Program)	400° C to 1200° C
• Hold Time 2 (2-Stage Program)	00:00:00 to 18:10:00
• When Table Opens	

Rotate the **Selector Knob** to select the setting, then push the **Selector Knob** OR press the **Next** button to store the parameter. This is the final parameter. You will automatically be returned to the Main Menu.

Introduction to Sense Pressing

Introduction

Time, Temperature, and Pressure

Conventional pressings have classically been defined by fixed combinations of time at a given temperature, followed by a certain amount of pressure applied to the ceramic to transfer it into the mold. All ceramic manufacturers publish these parameters, usually a set for 100 gram molds, and a set for 200 and 300 gram molds.

The Hold time at the Hold Temperature insures the mold is fully heat soaked and that the ceramic ingots have reached their vitreous point so that when pressure is applied the ceramic will flow into the mold pattern(s).

The Press Time is a worst case value in conventional pressing furnaces which compensates for the number of patterns, how they are sprued, and the wax weight of each pattern. In many cases the ceramic has completely filled the patterns significantly before the Press Time expires. There was no way to determine when the patterns were filled with conventional technology.

Conventional technology also uses a constant, unyielding, pressure until the Press Time expires. Keeping this pressure applied after the patterns are full only risks stressing the investment material unnecessarily.

Types of Pressable Ceramics

Until fairly recently, virtually all press-able ceramics were feldspathic based ceramics, which tend to be more viscous than the newer lithium-disilicate based ceramics, as they flow into the mold. This higher viscosity requires a longer Press Time at a given Hold Temperature and applied pressure to fill equivalent molds. The newer lithium-disilicate ceramics flow more freely at a lower Hold Temperature and fill the patterns more rapidly. They also change state from a solid to a near liquid very abruptly, over the span of just a few degrees of temperature.

Conventional technology pressing ovens are not optimum for pressing lithium-disilicate ceramics because the worst-case Press Time settings keep the ceramic material above the vitreous point longer than necessary, giving the ceramic more opportunity to chemically react with the surrounding investment material, forming a reaction layer over the surface of the pattern which, once formed, must be removed in a secondary operation once the mold has been divested.

The SP Pressing Furnace senses the movement of the ceramic in real time, and when the movement ceases (the patterns are filled), the muffle heater is turned off, the vacuum is released, and the table is lowered as quickly as possible to drop the mold temperature below the vitreous point of the ceramic before a significant reaction layer has a chance to form. The thermal mass of the mold itself will inherently control the rate of cooling, to prevent thermal shock to the ceramic as it cools. It only requires ten to twenty degrees Celsius drop to fall below the vitreous point, (solidify) then the mold mass will allow the ceramic to anneal as it cools in ambient air.

Mold Cracking

In addition to the ability of the SP Pressing Furnace to sense the flow of the ceramic, it also simultaneously employs a unique technology to minimize the risk of over-stressing the investment mold as pressure is applied.

As previously discussed, conventional pressing furnaces apply a constant pressure throughout the Press Time. The SP Pressing Furnace initially applies only about 62% of the final pressure to bring the press rod up to, and in contact with, the mold plunger. This eliminates 40% of the inertia, which can “cleave” a mold as the investment material is

loaded suddenly. Once the press rod is in contact with the mold plunger the other 40% is applied, bringing the initial pressure up to the ceramic manufacturers rated pressure. There is also a unique feature to salvage molds which have hairline cracks in the top or side coming out of the burnout oven. At the time the mold is inserted into the SP Press, the furnace will ask the question, "Split Mold, reduced pressure? No." The default answer is "No," for (Use full regulator pressure), but if the mold already has cracks in it you can turn the knob until the screen says "Yes," and the unit will automatically use 62% of the regulator pressure. The pressing time will go up by about 1/3, but the reduced pressure is more likely to avoid splitting the mold, finning, etc. It still beats having to toss the split mold and start over.

Similarities & Differences

Mechanical Differences

The SP Pressing furnace uses a special actuator cylinder with an inflatable piston seal and a return spring to bring the press rod back to the top position when not pressing. The reason you should care about this is that the system was designed to work **only with an applied pressure of 70 PSI/4.8 BAR. In actuality, only a maximum of 60 PSI ever reaches the investment mold because the return spring counteracts 10 PSI of air pressure.** The Split Mold reduced pressure applies only 46 PSI air pressure, but again, this is reduced by the return spring to a 37 PSI equivalency. **DO NOT REDUCE THE APPLIED AIR PRESSURE EITHER BELOW 70 PSI/4.9 BAR OR ABOVE 72 PSI/5.0 BAR or unreliable operation will result.** The furnace software will prompt you to adjust the pressure inside this range if it is not already.

Pressing Parameters

There are no new parameters with the SP Pressing Furnace. One parameter, however, is used in a slightly different way. The Press Time parameter is still the ceramic manufacturer's specified time under pressure, but it should only come into play rarely if ever. The pressure sensing technology in the SP Pressing Furnace determines the actual termination of the pressing cycle. This can be as much as 60% less time than the manufacturers specified Press Time. **The Press Time program parameter merely serves as a "backup timer" or time not to exceed.** The worst that can happen is that the Press Time will run to the manufacturer's rated press time.

Fusing Adjust Parameter

The Fusing Adjust parameter is the next to last parameter when entering a program. It's default value is zero degrees. If you desire to modify the Hold Temperature, but don't want to disturb standardized program values, you can enter a negative offset if the furnace is currently "overfiring" or a positive value if the furnace is currently "underfiring". This offset will be subtracted from or added to the Hold Temperature parameter. If no compensation is needed, just ignore the parameter and the default zero compensation will be used.

Process Differences

The conventional pressing process can still be used if desired. The SP Pressing Furnace can operate just like the Pro Press 200, meaning that the air pressure is applied at a constant level throughout the press cycle and the Press Time parameter controls the termination of the cycle when the timer expires. This does not take advantage of the SP Pressing Furnace's advanced pressing technology.

During the running of a Conventional program the vacuum pump will come on during the Rate Rise cycle, and turn off when the vacuum level reaches 71 cm (or other value if you change the default 71cm) of mercury inside the muffle. If the Furnace is set up to use intermittent vacuum the pump may intermittently cycle on and off as needed to stay above 68 cm of mercury.

The same applies to the SP Pressing mode of pressing with one notable addition. A few seconds before the Hold Time expires, the vacuum pump will come on and remain on until the pressing cycle finishes (typically 1 to 2 minutes). This serves two purposes; (1) it insures the best possible vacuum when the ceramic is in a molten state, (2) it reduces the electronic noise of the electrical pump surge current which can disturb the ultra-sensitive pressure digitization signal. The pump will turn off automatically when the SP Pressing electronic pressure signal determines the mold is fully filled, as well as set the muffle temperature back to the idle value. There will be some delay between the time the pump turns off and the table lowering. This is due to the time it takes for air to re-enter the muffle. The table cannot be lowered any quicker because the vacuum inside the muffle is holding the table closed until the incoming air relieves the vacuum.

Conventional and SP Pressing programs can exist side by side in the Furnace's program list. Conventional **program names do not have the "%"** character as the first letter of the Program Name, **SP Pressing programs do have the "%" as the first letter of the Program Name.** This special character in the program name is how the SP Press "knows" to use the SP Press technology on a given program.

Add/Edit a Sense Press Program

Program Entry

The following steps will take you through the entry of SP Press Program entry. As you can see below, it's really just like entering a conventional pressing program, the main difference being the "%" character being the first letter in the Program Name.

Program Number

Select any unused program slot in the list. Unused programs have blank Program Names.

012 _____

Program Type

1. Stage 1 <single stage non-pressing type>
2. Stage 2 <two stage non-pressing type>
3. **SP Press <Sense Press pressing type>**
4. Conventional Press <conventional pressing type>

Roll the knob until the cursor is pointing to Type 3 to enter an SP Press program, press the knob or the **Next** button to select it.

Program Name

```
*Add/Edit Program*
Enter Program Name
010-%XXXXXXXX
              ^
```

Enter up to 14 characters to identify the program. Press the knob when done.

Entry Temperature

```
*Add/Edit Program*

Entry Temp  700C (25C – 980C)
```

Enter the Entry Temperature value. For many ceramics, this is typically 700°C, but consult your ceramic manufacturer's datasheet and use their value. Then press the knob or the **Next** button to advance to the Rate Rise parameter.

NOTE: IF YOU WANT TO RE-ENTER ANY PARAMETER THE LAST BUTTON CAN BE USED TO BACK UP TO THE DESIRED PARAMETER.

Rate Rise

```
*Add/Edit Program*
Rate Rise                60C/M

(0C/M – 100C/M)
```

Enter the degrees per minute for the Rate Rise between the Entry Temperature and the Hold Temperature. Typically this value is 60°C per minute, but consult your ceramic manufacturer's datasheet and use their value. Press the **Next** button to continue.

Hold Temperature

```
*Add/Edit Program*
Hold Temp                935C

(700C – 1200C)
```

Enter the Hold Temperature value. Consult your ceramic manufacturer's datasheet and use their value, as this value can vary widely, depending on the ceramic used. Press the **Next** button to continue.

Hold Time

```
*Add/Edit Program*
Hold Time                00:15:00

(00:00:00 – 18:10:00)
```

Enter the Hold Time value. Consult your ceramic manufacturer's datasheet and use their value, as this value can vary widely, depending on the ceramic used. Press the **Next** button to continue.

Fusing Adjust

```
* Add/Edit Program *
Fuse Adjust?   0C (-34C - +34C)
```

Initially, it is recommended to leave the default value at zero. You may decide to modify this at a later date or not. Press the **Next** button to continue.

Maximum Press Time (Backup Time)

```
*Add/Edit Program*
Hold Time                00:15:00

(00:00:00 – 18:10:00)
```

Enter the Press Time value. Consult your ceramic manufacturer's datasheet and use their value, as this value can vary widely, depending on the ceramic used. Press the **Next** button to continue.

Conventional Press Firing Cycle Program

The following procedures describe how to enter a Pressing program:

1. Press the **Main Menu** button:
2. Select the **CHANGE PROGRAM** Item and push the **Selector Knob** OR press the **Next** button.
3. Turn the **Selector Knob** until ADD/EDIT PROGRAM is displayed.
4. Push the **Selector Knob** OR press the **Next** button.
5. A cursor pointing to the current program number will be displayed. If there is a name displayed after the program number this is a pre-existing program which you may edit by selecting it.

   To Add a program, rotate the **Selector Knob** to find the program number you want to add your new program into. If you select a program number that already has a program entered, you may overwrite the existing program with the new one.
6. Push the **Selector Knob** OR press the **Next** button to select a program for Addition or Editing. The display will present the stage type selection as below:

```
Select Type
> 1-Stage
  2-Stage
  SP Press
```

If the program you wish to Add requires only a single Rate Rise and Hold Temperature, select 1-Stage. If the program requires an initial Rate Rise and Hold Temperature, followed by a secondary Rate Rise and Hold Temperature, select 2-Stage. Push the **Selector Knob** OR press the **Next** button to select the program type.

7. Continue scrolling to Conventional Press Program. Push the **Selector Knob** OR press the **Next** button to select the program type as below:

```
Select Type
> Conventional Press
```

8. The display will change as shown below:

```
* Add/Edit Program *
Enter Program Name
  008 –
          ^
```

The ^ symbol under the position identifies the current character being entered. Rotate the **Selector Knob** to bring up the desired character, then push the **Selector Knob** OR press the **Next** button to advance to the next character in the Program Name. You may enter up to 14 characters. If you do not require all 14 characters then simply continue to press the **Next** button until the cursor is all the way to the right side and the display changes to the one shown below:

```
* Add/Edit Program *
Entry Temp 400C
(25C – 980C)
```

9. Entry Temperature

   Entry Temperature is the temperature at which the table will close completely.

   The range of values is 25° C (77° F) to a maximum of 980°C (1796°F).

   Rotate the Selector Knob to select the temperature value, then push the **Selector Knob** OR press the **Next** button to store the parameter.
10. Rate Rise

    Rate Rise is the number of degrees per minute the temperature will rise after the table has closed.

    The range of values is 0° C/Minute (0° F) to a Maximum of 100° C/Minute (180° F).

    Rotate the **Selector Knob** to select the heat rate value, then push the **Selector Knob** OR press the **Next** button to store the parameter.
11. Hold Temperature

    Hold Temperature is the final, highest temperature in a 1-Stage Program, or an intermediate stopover temperature in a 2-Stage Program.

    The range of values is 400° C (752° F) to a maximum of 1200° C (2192° F).

    Rotate the **Selector Knob** to select the temperature value, then push the **Selector Knob** OR press the **Next** button to store the parameter.
12. Hold Time

    HOLD TIME is displayed. This is the amount of time desired to hold the porcelain at the final temperature, before the furnace begins to press.

    The range of values is 00 hours, 00 minutes, 00 seconds, to a maximum of 18 hours, 10 minutes, and 00 seconds.

    Rotate the Selector Knob to select the time value, then push the **Selector Knob** OR press the **Next** button to store the parameter.

NOTE: RE-PRESS IS SELECTED IN THE CALIBRATE OVEN SECTION OF THIS MANUAL, USING PASSWORD 315.

13. Fusing Adjustment Parameter

```
* Add/Edit Program *
Fuse Adjust?          0C
(-34C - +34C)
```

IMPORTANT NOTE: THE FUSING ADJUSTMENT PROGRAM PARAMETER IS SIMILAR TO THE HIGH FUSING ADJUST AND LOW FUSING ADJUST FUNCTIONS FROM THE SPECIAL FUNCTIONS MENU IN THAT ANY VALUE ENTERED HERE WILL EITHER ADD TO, OR SUBTRACT FROM, THE HOLD TEMPERATURE PARAMETER IN THE PROGRAM. THE PROGRAM LEVEL FUSE ADJUST PARAMETER ADJUSTS THE HOLD TEMPERATURE ONLY FOR THE PROGRAM IT IS ENTERED IN, WHERAS THE SPECIAL FUNCTIONS/ HIGH FUSING ADJUST AFFECTS ALL PROGRAMS WITH A HOLD TEMPERATURE >800° C (1472° F) AND THE SPECIAL FUNCTIONS/LOW FUSING ADJUST AFFECTS ALL PROGRAMS <800° C (1472° F).

Why do you need fusing adjustments?

The **Program Level Fusing Adjust** is useful for making minor adjustments to a single, specific Program without altering the original Program design.

The Special Functions High/Low Fusing Adjustments features are useful for matching the firing characteristics of two furnaces so that they fire identically, no matter which furnace you use.

Upon initial **Program Addition**, you will want to use the original Program parameters as directed, until your experience suggests a specific Program adjustment is indicated.

14. PRESS TIME or RE-PRESS TIME is now displayed.

- PRESS TIME — Turn the **Selector Knob** to select the amount of time required to press your ceramic material. This function allows control of the press time from 1—30 minutes, but does not give you RE-PRESS time. After selecting the correct amount of time; press the **Next** button or press the **Selector Knob** to enter the program.
- RE-PRESS TIME — This function is password protected and adds an additional four (4) minutes to the selected amount when entering parameters under Re-Press Time. To use this function, you must have selected it in the **Special Functions** section under **Calibration** (see page 16 of instructions). The press rod remains extended during this period with no pause between the amount of time selected in the parameters and the additional four (4) minutes of the re-press.

NOTE: THE PRESS ROD STAYS EXTENDED DURING AND BETWEEN BOTH THE INITIAL AND RE-PRESS TIMES.

15. Cool Time

    The **Cool Time** parameter specifies the length of time the table takes to go from the full up position to the full down position, with several intermediate pauses along the way.

    The range of values is 00 hours, 00 minutes, 00 seconds, to a maximum of 1 hour, 39 minutes, and 00 seconds.

    Rotate the **Selector Knob** to select the time value, then push the **Selector Knob** OR press the **Next** button to store the parameter.

Copy/Change a Program

The **Copy/Change** a program feature allows a program to be copied from one program number to another and then changed. This feature is very useful when there are only minor differences between programs.

Procedures:

1. Press the Main **Menu** button.
2. Select **Change Program**, push the **Selector Knob** OR press the **Next** button.
3. Turn the **Selector Knob** until **COPY/CHANGE PROG** is displayed. Push **Selector Knob** OR press the **Next** button to select this feature.
4. **COPY FROM:** is displayed. The second line displays a program number and name. Turn the **Selector Knob** to find the program to be copied. Push the **Selector Knob** OR press the **Next** button to continue.
5. **COPY TO:** is displayed. Turn the **Selector Knob** to select a location for the copied program. If a program that is already entered is selected, you will write over the existing program. Push the **Selector Knob** OR press the **Next** button.
6. At this point, changes to the program may be made in the same manner as described in the section Add a Program on page 18. Refer to that section for instructions specific to each type of firing program.

Move a Program

The **Move** program feature allows a program to be moved from one number to another. This feature is useful for grouping programs for operator convenience.

Procedure:

1. Press the **Main Menu** button.
2. Select **Change Program**, push the **Selector Knob** OR press **Next** button.
3. Turn the **Selector Knob** until **MOVE PROGRAM** is displayed. Push **Selector Knob** OR press **Next** button to select this feature.
4. **MOVE FROM:** is displayed. The second line displays a program number and name. Turn the **Selector Knob** to find the program you wish to move. Push the **Selector Knob** OR press **Next** button.
5. **MOVE TO:** is displayed. Turn the **Selector Knob** to find the program number you wish to move to. If you select a program that is all ready entered, you will write over the existing program. Push the **Selector Knob** OR press the **Next** button to finish. You will be returned to the Main Menu automatically.

Erase a Program

This feature allows you to erase a program from memory. The space occupied by any program erased will become available for adding a new program.

Procedure:

1. Press the **Main Menu** button.
2. Select **Change Program**, push the **Selector Knob** OR press **Next** button.
3. Turn the **Selector Knob** until **ERASE A PROGRAM** is displayed. Push the **Selector Knob** OR press **Next** button to select this feature.
4. **ERASE A PROGRAM:** is displayed. Turn the **Selector Knob** to find the program you wish to erase. Push the **Selector Knob** OR press **Next** button to continue.
5. **ERASE ??? NO** is displayed. Turn the **Selector Knob** to **YES** to erase this program or **NO** to abort. Push the **Selector Knob** OR press **Next** button to continue. You will be returned to the Main Menu automatically.

Chapter Four — Run Program Menu

Turn the **Selector Knob** until the desired program is displayed. If the table has not been lowered, do so now.

Press the **Start Program** button to begin this program.

Continue through this chapter to learn all of the displays and features available while a program is running.

The Run Program mode allows you to run programs and to view programs as they are running.

NOTE: YOU MUST BURN THE MOISTURE OUT OF THE MUFFLE BEFORE FIRING THE FIRST TIME. SEE THE NOTATION UNDER "CHANGE IDLE TEMPERATURE" ON PAGE 10.

Running a Program – Repeat Programs

The furnace features a one-button repeat feature. If a program needs to be repeated, simply press the Selector Knob and the last program run will be repeated.

NOTE: THIS FEATURE IS DISABLED IF ANY SPECIAL FUNCTIONS HAVE BEEN ACCESSED OR IF THE CHANGE PROGRAM FEATURE HAS BEEN USED AFTER THE LAST PROGRAM WAS RUN.

Loading Your Work Into the Furnace

Press the down arrow key ⬇ to lower the work platform. Place your work on the firing tray, press the **Start Program** button and it will raise automatically under **program control.**

Features and Displays Available While a Program is Running

The following illustration shows the display when a program is running:

```
<Prog No. – Prog. Name>
><Current Program Segment>

            <Program Time Remaining>
                    HH:MM:SS

<Current muffle temperature>      <Current Vacuum
```

Rotating the **Selector Knob** while the Program is running will display additional information in four, successive screens:

The first alternate screen:

```
Target Temperature:                <XXXX C>

Actual Temperature:                <YYYY C>

Vacuum:                            <ZZZ CM>
```

The second alternate screen:

```
<Prog No. – Prog. Name>

Time Left:                         <HH:MM:SS>

Step Left:                         <HH:MM:SS>

NEXT = SKIP STEP
```

NOTE: IF THE NEXT BUTTON IS PRESSED FROM THIS SCREEN THE PROGRAM WILL SKIP TO THE NEXT PROGRAM SEGMENT.

The third alternate screen:

```
<Prog No. – Prog. Name>

Change This Program?



Press Knob = Continue
```

NOTE: IF THE SELECTOR KNOB IS PRESSED WHILE THIS SCREEN IS BEING VIEWED YOU WILL AUTOMATICALLY FIND YOURSELF IN THE PROGRAM EDIT MODE WITH THE THE FIRST PARAMETER DISPLAYED BEING THE NEXT PROGRAM SETTING AFTER THE CURRENTLY RUNNING SEGMENT. THIS FEATURE ALLOWS YOU TO ALTER THE PROGRAM WHILE IT IS RUNNING. AFTER THE PROGRAM FINISHES THIS RUN THE EDITED PARAMETERS WILL CHANGE BACK TO THE ORIGINALLY STORED VALUES. THE CHANGES YOU MAKE USING THIS ALTERNATE SCREEN, DURING A RUNNING PROGRAM WILL NOT BE PERMANENT.

The fourth alternate screen:

```
<Prog No. – Prog. Name>

Night Mode After?

>No

Next = Option Change
```

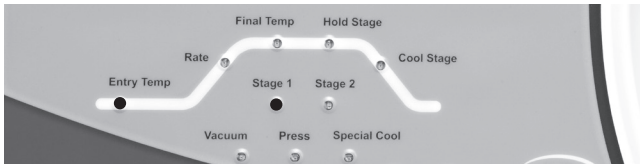
Pressing the **Next** button will toggle the "No" in the screen above to "Yes". Pressing the **Next** button a second time will change the "Yes" to "No".

The LED Graph

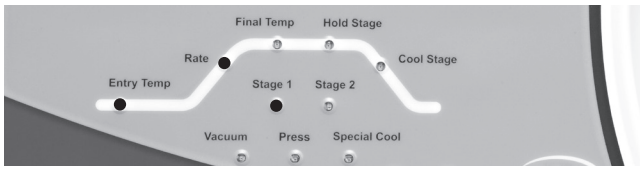
The LED graph follows the running Program's progress and provides a quick visual reference on how far the program has progressed.

The illustrations below demonstrate the progression of LEDs on a 1-Stage Program:

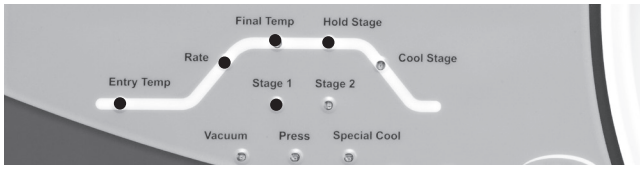
>Pre Dry segment:



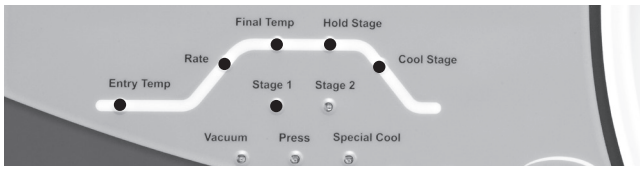
>Rate Rise segment:



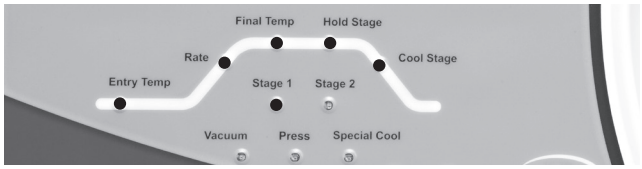
>Hold Temp segment:



>Closed Cool segment:

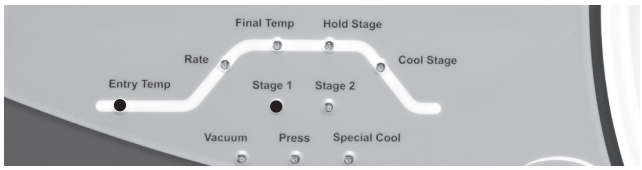


>Open Cool segment:

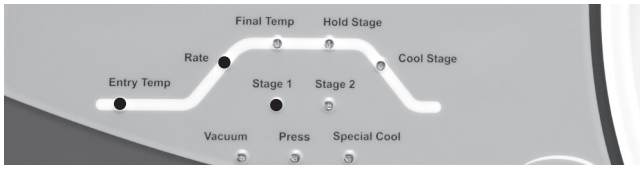


The illustrations below demonstrate the progression of LEDs on a 2-Stage Program:

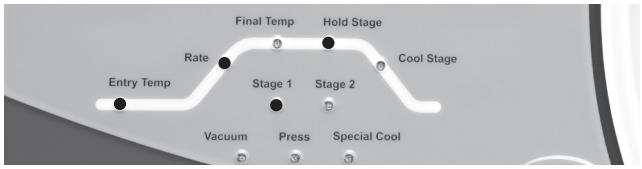
>Pre Dry segment:



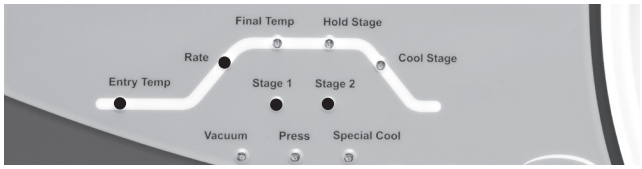
>First Rise segment:



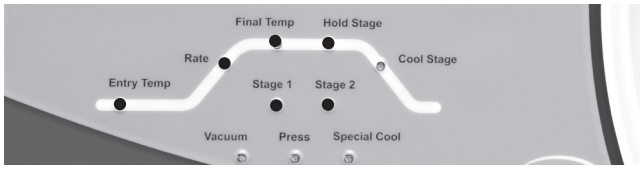
>First Hold segment



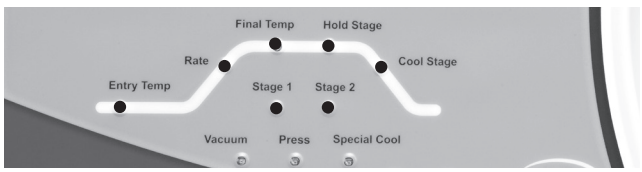
>Second Rise segment:



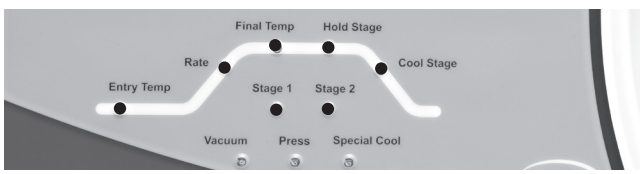
>Second Hold segment:



>Closed Cool segment:

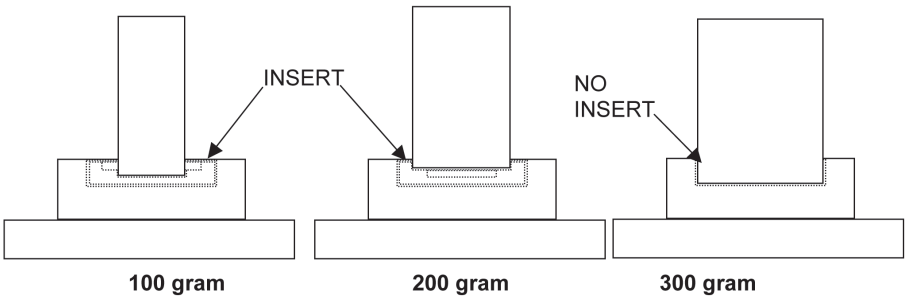


>Open Cool segment:



Running a Pressing Program

The ProPress SP can press into a 100, 200, or 300 gram investment mold. Configure the firing tray and press insert as show below for each size mold.



Running a SP Pressing Program

Make sure the air regulator is set to 70 psi/4.8 bar. Do NOT exceed 72 psi/5.0 bar as this can damage the SmartPress pressure sensor.

1. Select desired program with a "%" character at the left side of the program name.
2. Press the Knob to launch the program.

If the current muffle temperature is **below the Entry Temperature of the program** you will see a "Fast Rise" message on the display as the muffle heats upward toward the Entry Temperature.

During this time, the SP Press will do a test cycle of the pneumatic system. You will hear some valves clicking and the press cylinder extending with a bit of a thump as it wipes the cylinder walls down to insure smooth action during the actual pressing. The thump may sound alarming but it is just the piston head contacting the bottom stops, this will not occur during the actual pressing as the mold will prevent it.

If the current muffle temperature is **below the Entry Temperature of the program** you will hear the pneumatic system test followed immediately by the message "Press Next To Lower Table"

The furnace, being at or above the program Entry temperature will play an alert tune and "hover" in this mode until you are ready to place the mold in the oven.

Split Mold Salvage Feature

If you see hairline cracks or splits in the top face of the mold as it comes out of the burnout oven you may elect to do the pressing with reduced pressure to avoid splitting the mold wide open. Check your mold visually before placing the mold in the oven.

Press the **Next** button to lower the table, place your mold on the stepped ceramic insert, verify the mold is centered.

You will see a message "Split Ring Reduced Pressure No" on the display, along with "Press Next to Raise the Table." The "No" signifies that the default is pressing with the full 70 psi/4.8 bar pressure. If you see a split or crack in the top of the mold and want to reduce the pressure, roll the Knob until you see "Split Ring Reduced Pressure Yes," then press the Next button to raise the table. The software will automatically add 1 minute to the Max Press Time (backup time) as it will take slightly longer to press with reduced pressure. This would typically be 25-30% more time, but there is no additional wax-up.

The furnace will handle everything from this point forward. The Rate Rise and Hold Time/Temperature segments will execute, then when the Hold Time expires, the SP Press will monitor the pressure in the mold, when the pressure stops decreasing, the glass has filled the mold, and after a few seconds extra to ensure the fine details have formed, the pressing will terminate automatically, well before the programmed Max Press Time (backup time) is reached.

If you want to follow the progress of the pressing in real time, you can roll the Knob over to the screen with the "Pressure XXXX millibar" on the top line and follow the progress of the glass entering the mold.

When the pressing is completed, the vacuum will be released (it takes several seconds for the air to re-enter the muffle), the heater will be throttled back to the idle setting, and the "Program Finished" message will be displayed. The table will come down shortly thereafter.

Running a Re-Press Program

(For Conventional Pressing only)

To run a Re-Press Program, Calibration Password number 315 must be set to “Timed Press = No”

Press the **Special Functions** Key, then rotate the **Selector knob** to the “Calibration Password” prompt and press the **Next** button. At the password entry prompt rotate the **Selector knob** until the display says “315” and press **Next** button.

Timed Press = No

Rotate the **Selector Knob** until the screen looks like the one above and press the **Next** button. This has activated the Re-Press mode.

1. If the muffle temperature is below the entry temperature specified in the program, the table will raise to the closed position while the temperature rises. If the muffle temperature is above the entry temperature specified in the program, the table will remain down while the muffle cools. When the entry temperature is reached, the furnace will begin to beep continuously. The display will read:

Next = Raise table

2. If the table is up, press the **Next** button, the table will lower. With the table in the down position, place the ring onto the firing table and press the **Next** button.
3. The Pressing program will begin running.
4. The temperature will now rise to the final temperature selected in the program. When the final temperature is reached, the hold time will begin.
5. When the hold time has expired the display will read as shown below. The furnace will begin the first press. The first press will continue for four minutes. After the first press has been completed re-pressing will occur if password 315 is activated.

   (See the Calibrate Oven section of this manual for further information.)

Pressing

6. When running a re-press program the furnace will automatically press for four minutes and then the additional “Re-Press” time. The display will now say **RE-PRESSING** and the furnace will begin to re-press the work for the amount of time specified in the program. When the re-press time has expired, the press will fully retract and the table will lower automatically.

Re-Pressing

Chapter Five — Maintenance

Cleaning the Furnace

Your new furnace may be cleaned by using a soft cloth and kitchen cleaners such as Fantastic® or Formula 409®. The front panel should be cleaned with a window cleaner such as Windex®.

Never clean the display window with a dry cloth or tissue as this will scratch the surface.

Always moisten the cleaning cloth with a cleaner such as Windex® or water.

Only clean the table with Windex® or water and a towel. Using other cleaners will harm the anodized surface. You will encounter problems if 409® or Fantastic ® is used to clean the table.

CAUTION!!! NEVER OPEN THE INTERIOR OF THE CHASSIS BEFORE FIRST REMOVING THE AC ELECTRICAL POWER CORD. THERE ARE DEADLY VOLTAGES INSIDE.

Purge/Decontamination

Moisture removal must be done first:

When the furnace is unused for prolonged periods of time, the muffle insulation will absorb moisture. This moisture can cause firing problems if not removed before firing porcelain. Moisture can also shorten the life of the vacuum pump. To remove moisture, change your idle temperature to 651°C/1204°F and leave your table open for at least an hour with the firing tray in place.

The purpose of a purge is to clean out cross-contaminations in the muffle. Charcoal can be used but can shorten the life of the thermocouple.

Follow the instructions for “Adding a program” to set up your Purge cycle using the following parameters.

- Select 1 Stage
- Name the program “Purge”
- Dry Time: 30 seconds
- Entry Temp: 400°C/752°F
- Rate Rise: 50°C/90°F
- Hold Temp: 1050°C/1922°F
- Hold Time: 15 Minutes
- Fuse Adjust: NO
- Table Down: 1050°C/1922°F
- Cool Time: 10 minutes
- Use Vacuum: YES
- Vacuum Level: 71mm/28in
- Start Vacuum During: Rate Rise @ 400°C/752°F
- Release Vacuum During: Hold time @ 5 Minutes

If you have any further questions regarding these instructions please contact TOPS at Whip Mix.

Trouble Shooting Guide

The ProPress SP furnace offers a number of self checks and warning messages that are designed to identify problems. Several of these are listed below:

Not Enough Vacuum
This error occurs if the furnace has not achieved its target vacuum level within 100 seconds. The program will abort automatically. Check the vacuum level setting. If the barometric pressure is unusual, you may have to call for fewer vacuums.

Check Programs
The computer has detected a corruption of the memory in the area where programs are stored. Check all programs and correct any that have been changed.

Call for assistance.

Temp Cal Error
An error has been detected in the temperature calibration. Recalibrate the temperature to correct this problem.

Vac Cal Error
An error has been detected in the vacuum calibration. Recalibrate the vacuum temperature to correct this problem.

Call for assistance.

Max Temp Error
The computer has detected a temperature reading higher than the maximum allowed. The furnace will automatically shut the heating elements off. Turn the power off to reset this error. If the error occurs again call for assistance.

Thermocouple Error
This error occurs if the furnace detects an open thermocouple for a period of 25 seconds. The furnace will automatically turn off the heating elements. The furnace should be turned off and on again to clear this error. If the error occurs again, the thermocouple should be replaced.

Call for assistance.

If, for any reason, you need to access the interior of the chassis for the purpose of minor servicing or replacement of components such as valve plungers, you must remove the chassis top plate via two screws on the rear of the chassis, then slide the chassis top plate towards the front of the furnace, then lift it up and set it aside. DO NOT remove the six screws on the bottom of the chassis in an attempt to remove the entire chassis top assembly as the bottom portion contains various electrical connections which will prevent the removal of the bottom or subject the electrical connections to damaging stress unless first disconnected from the top.

NOTE: IF HAZARDOUS MATERIAL IS SPILLED ON OR INSIDE THE FURNACE, CONTACT WHIP MIX TECHNICAL SUPPORT IF THERE IS ANY DOUBT AS HOW TO SAFELY REMOVE THE MATERIAL.

Vacuum Test

1. Press the ⬆ **Up** arrow button to raise the table fully up. You cannot start a vacuum test until the table is fully up.
2. Select the **Special Functions** item.
3. Turn the **Selector Knob** to **Test Furnace**. Press the **Next** button.

```
* Special Functions
  Export Settings
  Import Settings
> Test Furnace
```

4. Turn the **Selector Knob** to **Vacuum Test**. Press the **Next** button. The vacuum test will automatically begin.

```
Test Furnace
> Vacuum Test
  Press Test
  Muffle Test
```

There will be three, numerical indicators on the screen, each has its own individual meaning.

- The number to the far left is the vacuum count. That is the vacuum sensor reading.

```
Vacuum Test On
  90     00CM       99
Next=Test Hold
```

```
Vacuum Test On
 223     65CM       99
Next=Test Hold
```

- The second in the middle is the centimeters or inches of mercury.
- The third is the current condition of the table 0 = moving, 99 = fully up or fully down.

5. Watch the numerical indicators as they rise.
6. The third value should stay at 99 and not change.
7. Once the vacuum has reached 240, press the **Next** button. This will place the test in the hold position and allow you to watch for changes in vacuum value and readings.

   The acceptable loss is 2 cm or 1 inch within six minutes.
8. Once the test has been in hold for 6 minutes, press the **Next** button and the test will end.
9. If the numbers dropped outside the acceptable loss range, then the vacuum system has a leak and it must be repaired and recalibrated.

Fuses

The furnace contains two fuses:

- On the rear, just below the power cord, there are two 12 Amp (115 Vac) Slo-Blo or two 7 Amp (220 Vac) Slo-Blo, .25 x 1.25 inch ceramic fuses.

If More Help is Needed

We hope you have many years of trouble-free service from your furnace. If you do have problems with the furnace, or if you have questions about the furnace not covered in the manual, contact your dealer or Whip Mix at:

www.whipmix.com
Phone: 800-626-5651
Fax: 502-634-4512
E-Mail: tops@whipmix.com

Be prepared to provide the following information:

1. Your name
2. Your lab's name and address
3. Your lab's phone number
4. Your lab's fax number or email address
5. Furnace model and serial number (serial number can be found on the rear of the furnace)
6. Your question/problem

When you call, it would be helpful if you are near the furnace. The technician will probably ask you to run tests and report the results, or read the display while the test is running.

Replacement Parts

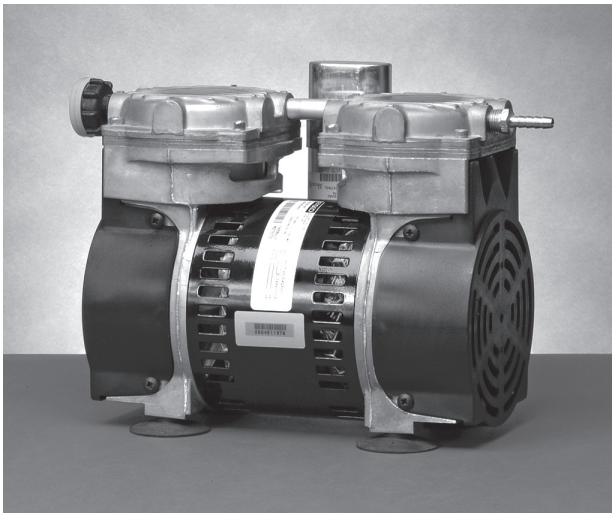
Part Number	Description
96004	Power Cord 115V
96008	Power Cord 230V
96001	Ceramic Plunger Rods Pkg. of 2
96020	Investment Ringliner Pkg. of 10
96147	Vacuum Valve Plunger 3 way
96070	Vacuum Valve Plunger 2 way
96094	Lift Limit Sensor
96021	Lift Belt
96025	Table
96345	SP Press Regulator with Quick Disconnect
96012	Press Insert Trays
96013	Firing Tray with recess (Press)
96015	Firing Tray Regular
96339	Encoder Assembly (Selector Knob Control)
96336	Key Pad Assembly
96341	Vacuum Sensor Assembly
96346	Flash Drive ProPress SP
96016	Fuses (115 VAC – 12 Amp) Pkg of 2
96092	Fuses (250 V – 7 Amp Slo-Blo) Pkg of 2

Note: Other replacement parts available. Contact TOPS at 800-626-5651 for assistance. **Must have serial number on unit to identify correct part.**

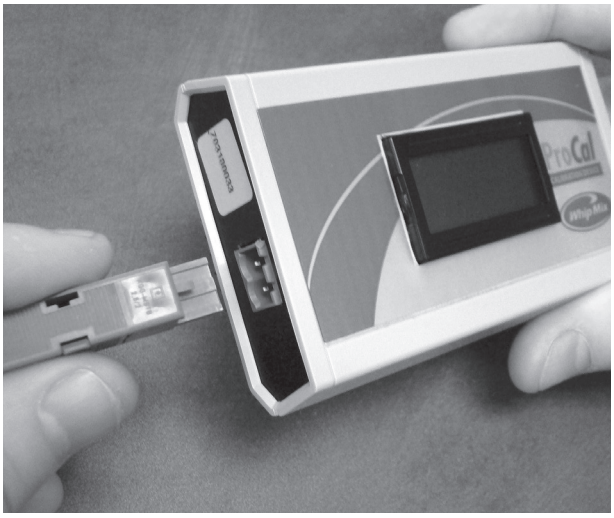
Technical Specifications

Power Supply	120 VAC ± 10% 50/60Hz
Power Consumption	1200W - Furnace Alone 1400W - With Pump
Shipping Weight	77 lbs.
Muffle Windings	Quartz Tubing
Muffle Chamber	3 3/4 W x 2 1/2 H x 3 3/4 D
Maximum Temperature	2200°F
Dimensions	19.5"/49.3cm W 22.5"/57.2cm H 27.5"/70cm L

Pro Series Accessories



High-Efficiency Vacuum Pump



ProCal

Fahrenheit to Centigrade

° F	° C	° F	° C	° F	° C	° F	° C
100	38	630	332	1,160	627	1,690	921
110	43	640	338	1,170	632	1,700	927
120	49	650	343	1,180	638	1,710	932
130	54	660	349	1,190	643	1,720	938
140	60	670	354	1,200	649	1,730	943
150	66	680	360	1,210	654	1,740	949
160	71	690	366	1,220	660	1,750	954
170	77	700	371	1,230	666	1,760	960
180	82	710	377	1,240	671	1,770	966
190	88	720	382	1,250	677	1,780	971
200	93	730	388	1,260	682	1,790	977
210	99	743	393	1,270	688	1,800	982
220	104	750	399	1,280	693	1,810	988
230	110	760	404	1,290	699	1,820	993
240	116	770	410	1,300	704	1,830	999
250	121	780	416	1,310	710	1,840	1,004
260	127	790	421	1,320	716	1,850	1,010
270	132	800	427	1,330	721	1,860	1,016
280	138	810	432	1,340	727	1,870	1,021
290	143	820	438	1,350	732	1,880	1,027
300	149	830	443	1,360	738	1,890	1,032
310	154	840	449	1,370	743	1,900	1,038
320	160	850	454	1,380	749	1,910	1,043
330	166	860	460	1,390	754	1,920	1,049
340	171	870	466	1,400	760	1,930	1,054
350	177	880	471	1,410	766	1,940	1,060
360	182	890	477	1,420	771	1,950	1,066
370	188	900	482	1,430	777	1,960	1,071
380	193	910	488	1,440	782	1,970	1,077
390	199	920	493	1,450	788	1,980	1,082
400	204	930	499	1,460	793	1,990	1,088
410	210	940	504	1,470	799	2,000	1,093
420	216	950	510	1,480	804	2,010	1,099
430	221	960	516	1,490	810	2,020	1,104
440	227	970	521	1,500	816	2,030	1,110
450	232	980	527	1,510	821	2,040	1,116
460	238	990	532	1,520	827	2,050	1,121
470	243	1,000	538	1,530	832	2,060	1,127
480	249	1,010	543	1,540	838	2,070	1,132
490	254	1,020	549	1,550	843	2,080	1,138
500	260	1,030	554	1,560	849	2,090	1,143
510	266	1,040	560	1,570	854	2,100	1,149
520	271	1,050	566	1,580	860	2,110	1,154
530	277	1,060	571	1,590	866	2,120	1,160
540	282	1,070	577	1,600	871	2,130	1,166
550	288	1,080	582	1,610	877	2,140	1,171
560	293	1,090	588	1,620	882	2,150	1,177
570	299	1,100	593	1,630	888	2,160	1,182
580	304	1,110	599	1,640	893	2,170	1,188
590	310	1,120	604	1,650	899	2,180	1,193
600	316	1,130	610	1,660	904	2,190	1,199
610	321	1,140	616	1,670	910	2,200	1,204
620	327	1,150	621	1,680	916	2,210	1,210

Centigrade to Fahrenheit

° C	° F	° C	° F	° C	° F	° C	° F	° C	° F
35	95	300	572	565	1,049	830	1,526	1,095	2,003
40	104	305	581	570	1,058	835	1,535	1,100	2,012
45	113	310	590	575	1,067	840	1,544	1,105	2,021
50	122	315	599	580	1,076	845	1,553	1,110	2,030
55	131	320	608	585	1,085	850	1,562	1,115	2,039
60	140	325	617	590	1,094	855	1,571	1,120	2,048
65	149	330	626	595	1,103	860	1,580	1,125	2,057
70	158	335	635	600	1,112	865	1,589	1,130	2,066
75	167	340	644	605	1,121	870	1,598	1,135	2,075
80	176	345	653	610	1,130	875	1,607	1,140	2,084
85	185	350	662	615	1,139	880	1,616	1,145	2,093
90	194	355	671	620	1,148	885	1,625	1,150	2,102
95	203	360	680	625	1,157	890	1,634	1,155	2,111
100	212	365	689	630	1,166	895	1,643	1,160	2,120
105	221	370	698	635	1,175	900	1,652	1,165	2,129
110	230	375	707	640	1,184	905	1,661	1,170	2,138
115	239	380	716	645	1,193	910	1,670	1,175	2,147
120	248	385	725	650	1,202	915	1,679	1,180	2,156
125	257	390	734	655	1,211	920	1,688	1,185	2,165
130	266	395	743	660	1,220	925	1,697	1,190	2,174
135	275	400	752	665	1,229	930	1,706	1,195	2,183
140	284	405	761	670	1,238	935	1,715	1,200	2,192
145	293	410	770	675	1,247	940	1,724	1,205	2,201
150	302	415	779	680	1,256	945	1,733	1,210	2,210
155	311	420	788	685	1,265	950	1,742	1,215	2,219
160	320	425	797	690	1,274	955	1,751	1,220	2,228
165	329	430	806	695	1,283	960	1,760	1,225	2,237
170	338	435	815	700	1,292	965	1,769	1,230	2,246
175	347	440	824	705	1,301	970	1,778	1,235	2,255
180	356	445	833	710	1,310	975	1,787	1,240	2,264
185	365	450	842	715	1,319	980	1,796	1,245	2,273
190	374	455	851	720	1,328	985	1,805	1,250	2,282
195	383	460	860	725	1,337	990	1,814	1,255	2,291
200	392	465	869	730	1,346	995	1,823	1,260	2,300
205	401	470	878	735	1,355	1,000	1,832	1,265	2,309
210	410	475	887	740	1,364	1,005	1,841	1,270	2,318
215	419	480	896	745	1,373	1,010	1,850	1,275	2,327
220	428	485	905	750	1,382	1,015	1,859	1,280	2,336
225	437	490	914	755	1,391	1,020	1,868	1,285	2,345
230	446	495	923	760	1,400	1,025	1,877	1,290	2,354
235	455	500	932	765	1,409	1,030	1,886	1,295	2,363
240	464	505	941	770	1,418	1,035	1,895	1,300	2,372
245	473	510	950	775	1,427	1,040	1,904	1,305	2,381
250	482	515	959	780	1,436	1,045	1,913	1,310	2,390
255	491	520	968	785	1,445	1,050	1,922	1,315	2,399
260	500	525	977	790	1,454	1,055	1,931	1,320	2,408
265	509	530	986	795	1,463	1,060	1,940	1,325	2,417
270	518	535	995	800	1,472	1,065	1,949	1,330	2,426
275	527	540	1,004	805	1,481	1,070	1,958	1,335	2,435
280	536	545	1,013	810	1,490	1,075	1,967	1,340	2,444
285	545	550	1,022	815	1,499	1,080	1,976	1,345	2,453
290	554	555	1,031	820	1,508	1,085	1,985	1,350	2,462
295	563	560	1,040	825	1,517	1,090	1,994	1,355	2,471